The Effects of Labor Market Reforms on the Labor Market Dynamics in Turkey

Seyit Mumin Cilasun and Elif Oznur Acar and Burak Gunalp

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Seyit Mümin Cilasun
Atılım University, Dept. of Economics, 06836 İncek, Ankara, Turkey
seyit.cilasun@atilim.edu.tr

Elif Öznur Acar*
Çankaya University, Dept. of Banking and Finance, 06810 Y.Mahalle, Ankara, Turkey
elifoznurkan@cankaya.edu.tr

Burak Gunalp
Hacettepe University, Dept. of Economics, 06800 Beytepe, Ankara, Turkey
gunalp@hacettepe.edu.tr

* Corresponding author: Elif Öznur Acar*, Çankaya University, Dept. of Banking and Finance, 06810 Y.Mahalle, Ankara, Turkey, elifoznurkan@cankaya.edu.tr

Abstract

The global economic crisis of 2008 had great repercussions on labor markets around the world. In order to mitigate the adverse effects of the crisis on employment, Turkey introduced a number of measures in the last quarter of 2008 and during the first half of 2009, such as a general reduction of social security contributions, targeted reductions for hiring youth and women, an increase in unemployment insurance payments and a more active use of the short-time working compensation program. Using the Income and Living Conditions Survey panel data for 2006-2010, this study aims at examining the role of labor market reforms in shaping the labor market performance in Turkey. To this end, we compute the Markov transition probabilities of individuals moving across three different labor market states: employment, unemployment and not in labor force. The results of the study reveal that the policy measures, in general, helped in alleviating the adverse effects of the crisis on the Turkish labor markets. The measures specifically targeting youth and women were effective in promoting the employment of these disadvantaged groups, the beneficial effects being more pronounced for women. However, the results show that after the coverage of these measures was broadened to include all workers, the advantage of young and female workers disappeared. Finally, the transition probabilities calculated for different education groups reveal that the probability of remaining in employment increases significantly with education.

Keywords: Labor market reforms, Markov transition analysis, Turkish labor market

JEL: J08, J16, J60

1. Introduction

The global economic downturn in the aftermath of the 2008 financial crisis had dramatic and lasting effects on the labour markets worldwide. As a result of declining economic activity, several workers lost jobs leading to sharp increases in unemployment rates in many countries. Governments responded with a range of measures to mitigate the adverse impact of the crisis on their labour markets, which in turn paved the way for a resurgence of interest in the role and relevance of regulations and institutions on the labor market outcomes. In this study, we aim to expand the existing literature by examining the role of labor market reforms in shaping the labor market performance in the particular context of the Turkish labor market.

Turkey, hit hard by the global financial crisis, experienced profound declines in its output and employment growth. Although the government was rather slow to react, it put into action a comprehensive employment incentives program with the hope to limit adverse effects of the crisis. Programs to decrease the tax wedge and to reinforce flexibility in the labor market, also publicly known as "employment packages", have been put into action to improve the overall market performance. The reforms that target to reduce the tax wedge included reductions in the employer's social security premium contributions and specific reform and incentive packages to promote youth and female employment. The programs to enhance labor market flexibility embodied allowance for short-term employment contracts, strengthening the role and responsibility of labor market institutions, advancing active labor market programs and several others.

What is the impact of the "employment packages" implemented by the Turkish government in the aftermath of the global financial crisis? Unfortunately, existing evidence on the effectiveness of these labor market programs is mixed and scant. Data limitations have hindered detailed analyses. Against this background, the aim is to perform an analysis to investigate whether the restructuring of the labor institutions and regulations have affected the performance of the Turkish labor market.

Towards this end, we use mobility analysis that have become readily available with the introduction of advanced panel data sets and techniques, leading to a paradigm shift in the labor market literature. More specifically, by using Markov transition processes, we calculate and discuss a set of probabilities based on annual worker transitions across distinct labor market states. As Bosch and Maloney (2010, p.3) claim: "labor status mobility can be assumed as a process in which changes in the states occur randomly through time and probabilities of moves between particular states are governed by Markov transition matrices". From the novel Turkish Income and Living Conditions Survey (SILC) panel data for the period 2006-2010, we compute the transition probabilities of individuals moving across three different labor market states: employment, unemployment and out of labor force. More specifically, we estimate annual individual transition probabilities for the periods 2006-2007, 2007-2008, 2008-2009 and 2009-2010, and aim to identify the effects of the reform packages.

The paper is organized as follows: In Section 2 we present a survey of the relevant literature. The third section gives an overview of the labor market in Turkey. The labor market reform packages launched in Turkey during the 2008 crisis are discussed in Section 4. The fifth section is devoted to data and the methodology. The results of the data analyses and their interpretations are presented in Section 6. Finally, the last section concludes.

2. Literature Survey

Most studies analyzing individual labor market histories can be classified in two categories: (i) studies that utilize duration models and (ii) studies that model individuals' transitions among some labor force states as a Markov chain process. A vast majority of the studies in the first category attempt to estimate the duration of unemployment as a function of personal characteristics and labor market conditions. The hazard functions are estimated using micro data sets. Whereas, the studies in the second category model individuals' experiences as a Markov chain process characterized by a transition matrix. The probabilities that form the transition matrix are parameterized as function of individuals' characteristics and labor market conditions. Certain dimensions of the transition matrix are then estimated, generally utilizing multinomial logit models and large panels obtained from labor force survey data.

Our study is related to the studies in the second category. It should be noted, however, that there are very few studies, to the best of our knowledge, which focus on the effects of labor market reforms on transition probabilities. Therefore, the literature survey below consists not only of these studies but also of some other research that could have some relevance to our proposed work.

In his seminal work Maloney (1999) examines mobility patterns in the Mexican labor market with an aim to test the traditional dualistic theory of formal and informal labor markets. The empirical analysis consists of calculating the raw probability of moving from an initial sector to a terminal sector, which is then standardized by the terminal sector size, separation rates from the initial sector and job openings in the terminal sector. Then he examines the underlying factors which determine probability of moving from one sector to another, through a multinomial logit model using experience, schooling and initial real wage as covariates.

Voicu (2002) uses micro data from the "Romanian Labor Force Survey" to analyze the effect of privatization on the Romanian labor market. The author studies the individual labor market histories and estimates the effects of personal characteristics on individuals' labor market decisions during the transition process. A multivariate probit model is used as empirical specification of the individual employment decisions. The results show that women have lower employment probabilities in all years, for all ages and educational categories. High education and high levels of specific skills help individuals maintain high employment probabilities for longer periods of time. Workers with ages at the two ends of age range have higher probabilities of both entering and leaving employment.

Hopenhayn (2004) analyzes the impact of the 1995 labor market reform in Argentina using a duration model. The panel data that the author employs allow him to compute conditional probabilities for transitions out of employment, thus avoiding the problem of stock sampling. In this way, his specification of hazard rates allows for duration dependence. The results of the study show that the reform had a very strong impact on labor turnover, increasing hazard rates during the trial period (the first three months) by almost 40 percent, without a compensating decrease for longer tenure. In contrast, the special regimes for small firms and young workers show no sizable effects.

Lima and Paredes (2007) analyze the dynamics of labor markets in Chile for the period 1962-2007. Their study is one of the very few studies in the literature that investigate whether the changes in labor laws have affected flexibility in labor markets. To this end, Lima and Paredes analyze mobility in different periods associated with different labor regulations: 1962-1966; 1967-1973; 1974-1979; 1980-1990; 1991-1998, and 1999-2007. The authors estimate transition probabilities across three possible states: unemployment, employment, and out of the labor force, and they associate flexibility with the size of these transition probabilities. They find that reforms such as that of 1967, which introduced the "just cause" requirement to fire workers, did not help workers to keep their jobs, but there is no evidence of significant changes in inflexibility. Other labor regimes significantly affected transitions, but surprisingly, it was the new regime put into effect in 1990, that increased mobility. The authors interpret this as the result of the consolidation of a flexibility prone model that, until then, had been associated with an unpopular imposition by the military regime.

Using the panel "Living Standards Measurement Study/Living in Bosnia and Herzegovina survey", Tiongson and Yemtsov (2008) study labor market dynamics in Bosnia and Herzegovina over the period 2001-2004. The authors investigate labor market transitions into and out of employment, unemployment and inactivity to better understand their covariates and how labor market disadvantages are distributed across demographic groups. They also speculate on the links between labor market transitions and welfare over the 2001 to 2004 period. The results of estimating a multinomial logit model of labor market transitions provide strong evidence that there are indeed significant differences in labor market transitions by gender, age, education, and geographic location. Using the panel structure of the multi-topic survey data, the authors find that these transitions are related to welfare dynamics, with welfare levels evolving differently for various groups depending on their market trajectories.

Fabrizi and Mussida (2009) follow a Markov chain approach to examine the labor market transitions between the states of employment, unemployment, and inactivity using individual-level data from the 1993-2003 labor force surveys in Italy. The labor market transition matrices are estimated at the beginning and at the end of the decade. The authors find evidence of increased labor market stability particularly due to increased unemployment persistence which in turn lead to enhanced long-term unemployment incidence. Some individual characteristics exert a significant impact on the probability of leaving the unemployment state. In addition, the effectiveness of flexible labor market legislation is related to the

reduction of short-term unemployment. The usefulness of these regulations was also related to reduction of the incidence of the shadow economy. The long-term unemployed, instead, remain locked-in the state of unemployment. This highlights the need for proper policy interventions to increase the employment opportunities of the long-term unemployed. The results for the employment transitions show the absence of increased employment opportunities for the disadvantaged labor market categories, especially for young and females.

Christodoulakis and Mamatzakis (2010) analyze Greek labor market dynamics at a regional base comprised of 16 provinces using Markov Chains for proportions data. They apply a Bayesian approach and a Monte Carlo Integration procedure that uncovers the entire empirical posterior distribution of transition probabilities from full employment to part employment, unemployment and economically unregistered unemployment and vice a versa. The results of the study show that there are disparities in the transition probabilities across regions, implying that the convergence of the Greek labor market at a regional base is far from being considered as completed. However, some common patterns are observed as regions in the south of the country exhibit similar transition probabilities between different states of the labor market.

To quantify the magnitude of transitions across occupational categories, Cuesta and Bohorquez (2011) use a panel of households representative of the main metropolitan areas in Colombia over the period 2008-2009. Results show that transitions between occupations are large and asymmetric; they are disproportionally more likely to happen from formal to informal occupations than vice versa. It is reported that such transitions are also different for salaried workers compared with the self-employed, as well as by poverty status of the worker. Salaried workers are more likely to transition first into other salaried jobs, while self-employed are more likely to transition into unemployment or out of the labor force. There are marked differences in the profiles of transitioning and non-transitioning workers, both in terms of socioeconomic characteristics and social security coverage. The results also show that affiliation to social security on health deters occupational transitions, while pension insurance does not.

The literature concerning the effects of labor market regulations on labor market outcomes is quite limited. To the best of our knowledge, there is no other study carried out for Turkey specifically investigating the effects of labor market reforms following the 2008 economic crisis on labor market dynamics by employing Markov processes. The previous studies on Turkey fall into two categories: the studies analyzing transition dynamics and the impact evaluation studies.

As an example of the first group of studies, Taşçı and Tansel (2005), using Household Labor Force Survey panel data of 2000 and 2001 computed Markov transition probabilities by gender, marital status and rural-urban residence for three labor market states: employment, unemployment and not in labor force. Moreover, they carried out multinominal logit regressions. Some of their major findings are as follows: For the urban women, while the probability of moving from unemployment to employment is lower than

urban men, the probability of moving from employment to unemployment is higher, which leads to higher unemployment rate for women. The probability of losing the job decreases with education.

İkizler and Tunalı (2012), using the same data set with Taşçı and Tansel (2005), investigated the transition dynamics in and out of agricultural and non-agricultural employment in the Turkish labor market for the 2000-2002 period by employing multinominal logit regression analyses. They corrected their analyses for attrition problems. One of the main findings of their study is that educational attainment and age are important in making a successful transition between agricultural and non-agricultural employment.

There are also some recent studies that investigate the outcomes of the reform packages which Turkey adopted during the 2008 global economic crisis. Uysal (2013) focused on the impact of employment subsidy program in 2008, the aim of which was to generate new employment for all women and young men, on the women in the age group 30-34. Using the difference-in-differences approach, she found a positive effect of the program. However, after the coverage of the program was extended to include all newly hired workers, the positive effect of the program on the employment of women and young men disappeared. Moreover, during the economic crisis, an added worker effect has been shown to present for women.

Similar to Uysal (2013), Balkan et al. (2014) investigate the impact of the same program on the Turkish labor market. Employing particularly the difference-in-differences techniques, they analyzed the impact of the program on the targeted disadvantaged groups. According to their results, while the most significant effect of the program is observed for older women, a weaker effect is found for young women and finally no effect is detected for younger men.

3. Overview of the Labor Market in Turkey

Despite having a young and dynamic population, Turkey has several structural problems in its labor market including low employment rate, high unemployment rate, widespread informality and large rural-urban differentials. The rise in the working age population continuously exceeds that in employment creation, hence results in low employment rate. Turkey's employment rate, measured as 43 percent in 2010, is remarkably low relative to international standards. It is one of the lowest among OECD member countries and similar to the MENA average. Similarly, Turkey's 48.8 percent labor force participation rate (LFPR) in 2010, is more than 10 percentage points below that of average LFPR of OECD members.

Turkish economy has been undergoing a deep structural transformation since the beginning of the 1980s. Shifting from agriculture to manufacturing, rapid urbanization and integration with the global economy increased the need for more skilled workers. This transformation necessitated reallocation of labor from lower to higher productivity activities which translated into a substantial change in sectoral employment trends. From 1980 onwards, share of agricultural employment in total employment has fallen significantly, and the weight of industry and services has increased sharply. Agricultural exodus has continued

throughout the 2000s. These changes lead to an overall increase in the productivity. Production per employee is approximately five and four times higher in services and industry, respectively, than it is in agriculture. Along these lines, it can also be claimed that the main driving force of productivity increases in Turkey has been internal migration for the last three decades. Since the urbanization and labor flows from agriculture to manufacturing and services will not be as rapid as it was before, productivity increases sourced from these forces will be limited. Therefore, there is a need for increasing productivity within sectors.

The main underlying factor behind Turkey's unfavorable labor market position is women's exceptionally limited participation in economic life. Female employment and participation rates have been consistently low throughout the 2000s. Turkey's 23.6 percent LFPR in 2007, is almost one third of OECD and EU-19 countries' rates at 62 and 64 percents, respectively but it is still higher than MENA average which is around 19 percent.

The sectoral transition in the Turkish Labor Market have been the main culprit in the already low and declining levels of female employment and participation rates. The jobs available in the rural areas are mostly in agriculture and suitable for women having low educational attainments. Those low skills women working as unpaid family workers in agriculture are forced to leave employment when they migrate to urban areas, given cultural/social forces and their low levels of education. As follows, urban unemployment rates are higher, employment and labor force participation rates are lower.

Another salient feature of the Turkish labor market is widespread informality. Informality has been following a decreasing trend over the last decade but still remains to be quite high. The share of informal employment in total employment gradually fell from 50 percent in 2004 to 42 percent in 2011.

4. Labor Market Reforms against the Crisis

The global financial crisis in 2008 reduced output severely in Turkey, with GDP contracting by 4.7 percent in 2009 and the unemployment rate soaring to 14 percent. The recovery was strong, however. By early 2011 the unemployment rate was back to its pre-crisis level, falling to 10.8 per cent in March 2011. In order to alleviate exacerbating unemployment and output losses, the Turkish government has launched several reform packages spread over the last quarter of 2008 and the first half of 2009 in general. Measures have included tax reductions and subsidies to promote investment and employment. It is estimated that as a ratio to the GDP, the fiscal costs of the overall reform package were 0.99% in 2008, 3.41% in 2009, and 2.23% in 2010 (Ercan, Taymaz and Yeldan, 2010).

The first reform package for labor markets was announced in October 2008 (known as the first employment package). The most important measures taken under the October package were: (i) Five percent reduction in social security premiums, (ii) Further reductions in the social security premiums for

the young (18-29 age group) and women workers (put into effect in July 2008), (iii) An increase in unemployment insurance payments by 11%, (iv) Increased subsidies for the disabled and impaired.

Starting from October 2008, employer social security premium payments were reduced by five percentage points, from 19.5% to 14.5%. Some 5.5 million workers were covered by this measure in 2009, rising to 6.4 million workers by end 2010. It is estimated that the program had cost savings of at least 32TL per worker, per month from October 2008 to January 2009. It is also estimated that the total cost of this program has reached to 3,358 million TL (2,200 million $) or to about 0.40% of the 2009 GDP estimate.

To encourage the hiring and retention of women and youth, the employer share of social security contributions for women and youth (aged 18–29) employed between May 2008 and May 2010 has been covered for a period of five years by the Unemployment Insurance Fund. Starting at 100 percent the first year, the subsidy gradually decreases to 20 percent in the fifth. In order to benefit, the employer must have recruited women and youth who were registered as unemployed for at least six months. Thanks to this measure, 61,615 new jobs were created in 2009, including 31,482 for women, and 63,230 in 2010, including 33,395 for women.

Unemployment insurance payments have been started to be calculated in terms of gross, instead of net income. This implied 11% increase in the unemployment benefits. Unemployment insurance benefits are paid to the unemployed worker on a monthly basis at the end of each month, and they cannot exceed 80 percent of gross minimum wage. Employers who hire those receiving unemployment insurance, and thereby promoting return to employment have also been given premium incentives.

The Wage Guarantee Fund was another component of passive employment programs. Initially established as part of the Labor Code No. 4857, the fund was annexed to the Unemployment Insurance Code No. 4447 in May 2005. Its main aim was to protect those workers employed in accordance with the Unemployment Insurance Law and who had been adversely affected from their employers' declaration of bankruptcy and/or revelation of inability to pay. Under those conditions the fund meets up to three months of unpaid wages of the affected workers. To be eligible for the fund, the employee has to be continuously employed by the firm a minimum of one year before the declaration of inability to pay. Since August 2003, 1% of the employers' share of unemployment insurance fund contributions was allocated to the Wage Guarantee Fund. Total assets of the fund reached to 104.4 million TL as of September 2009. It has disbursed a total sum of 1.1 million TL for 827 workers in 2008; and a total of 19.8 million TL for 10,463 workers in the first nine months of 2009 (Ercan, Taymaz and Yeldan, 2010).

In February 2009, a complementary package was announced which involved more active use of the short-time working compensation program. The short-time work scheme which is administrated by İŞKUR (Turkish Labor Agency) is designed to provide temporary reduction of working hours during the crisis. Companies may resort to short-time work to avoid the destruction of jobs otherwise viable in the long-

run. To mitigate the adverse effects of the crisis, the coverage of the program was extended from 3 to 6 months, and payments were increased by 50%. In addition, its scope has been extended to include sectoral and regional crises in addition to economic crises. When it was first put into effect in 2005, the short-time working compensation program had a very weak start. In 2005 only 21 employees were granted a total 10,567 TL (8,000$). In 2007, 40 workers were eligible to the program and paid a total of 22,051 TL (18,000$). Starting March of 2009 applications have surmounted and accelerated to a peak of 82,439 persons in June 2009. From 2008 to 2010 September, a total of 259,998 persons from 3,582 enterprises had benefited from the program with a total disbursement of 198.8 million TL (around 150m $) (Ercan et al., 2010).

In August 2009, a new package was enacted. With this package, employers' social security contributions for all new employees who were unemployed for at least three months prior to their hiring were also covered from the Unemployment Insurance Fund for a period of six months, as long as the additional worker represented an increase to the enterprise's workforce level as of April 2009. In 2009, 64,505 workers benefited from this program, rising to 76,144 in 2010. Social security contributions for employees hired while receiving unemployment insurance payments are also paid by the Unemployment Insurance Fund for the remaining months of their benefit period. Again, in order to be eligible for the subsidy, new hires had to represent an increase in the recipient enterprise's workforce as of April 2009.

In July 2009, a temporary public employment program through public infrastructure investment was put into effect. The size of the package was initially 1 billion TL (646 million USD). The package was launched in June 2009 with two major components: one was direct creation of temporary public employment (renovating schools and hospitals, refurbishing public parks, etc.); and the other was support for vocational schools, apprenticeship schemes, and job training with a view to boost employment. There were also other packages that included economic measures to stimulate demand and prevent layoffs. One of these measures was a cut in consumer and other forms of excise taxes from 18% to 8% in the automotive sector, electronics, and household appliances until the end of September 2009.

In addition to the passive employment policies, active employment programs offered by İŞKUR (Turkish Labor Agency) have been increased in the post-crisis period. These programs have included vocational courses, job-training, apprenticeships, and guidance towards job applications such as proper resume writing, etc. İŞKUR had been granted a total of 511,495 million TL over 2009 and 2010, respectively, for designing such programs. In 2009, total of 213,852 individuals benefited from the employment courses. 21,608 of these participants were under employment guaranteed courses. Over January–August of 2010 a total of approximately 184,586 individuals were engaged in such training programs, with 28,986 benefiting from employment guaranteed courses (Ercan et al., 2010).

5. Data and Methodology

5.1. Data

The data used in this analysis is drawn from the Turkish Income and Living Conditions Survey (SILC), which has been conducted by the Turkish Statistical Institute (TurkStat) since 2006. The nationally representative, rich, panel survey provides detailed information on the employment status, social security coverage, demographic characteristics, working hours, labor and other income, living conditions, job characteristics and socioeconomic conditions of the subjects. The analysis below focuses mainly on the years 2006, 2007, 2008, 2009 and 2010. For the specific aim and methodology of the study, panel samples are modified in two ways: (i) they comprise only the labor force between 15-64 years of age who are present in at least two consecutive years of the survey, (ii) workers in the agricultural sector are excluded.

The frequencies and shares of each labor market state (Unemployed (U), Inactive (N) and Employed (E)) for 2006, 2007, 2008, 2009 and 2010 are reported in Table 1.

<Insert Table 1 here>

The distribution reveals a stable pattern for all states across the four years under study. Inactives make up the largest share of total sample in 2006, but employed are the largest group for the other years in consideration. Unemployment rate stands around 5-6 percents in our sample. A gender breakdown of distribution analysis is of significant importance in the Turkish labor market. Indeed, the incidence of inactive women still stands as a major virtue of the Turkish labor market, distorting most aggregate labor market figures. Along these lines, Table 2 and 3 present a breakdown of the labor force into men and women and recalculation of the labor market distribution accordingly. As expected the inactivity rate increases to 70 percent for women and falls to 22 percent for men. That proves the magnitude of inactive women to be a fundamental driving force behind the labor market dynamics.

<Insert Table 2 here>
<Insert Table 3 here>

5.2. Method

We are going to investigate the impact of labor market reforms on the labor market transitions using Markov Transition Analyses. The use of micro-level panel data and multi-state stochastic models have enabed tracing individual labor market transitions between different labor market states through Markov chain models. As Fabrizi and Mussida (2009) summarize, Markov chain models enable estimating transition probabilities when subjects are observed only at discrete time points and exact transition dates are not available.

A random process X_t defined over a discrete state space $K = \{1, \dots, K-1\}$ is called a first-order discrete Markov chain if:

$$\Pr\ (X_t = k \mid X_{t-1}, \dots, X_1) = \Pr\ (X_t = k \mid X_{t-1}) \tag{1}$$

If X_t is a Markov chain and *j, k* $\in \{K\}$, the conditional probability:

$$p_{kj}(t, t+1) = \Pr\ (X_{t+1} = j \mid X_t = k) \quad \text{for } \forall t \text{ and } j, k \in K \tag{2}$$

is called the transition probability of moving from state *k* to *j* at time *t*. If the transition probabilities are independent of time, Markov chain is time-homogenous[2], that is:

$$p_{kj}(t, t+n) = \Pr\ (X_{t+n} = j \mid X_t = k) \quad \text{for } \forall t, n \text{ and } j, k \in K \tag{3}$$

Given a finite set of states $K = \{1, \dots, K-1\}$, transition probabilities can be represented in a discrete time transition probability matrix as follows:

$$P = \begin{bmatrix} p_{00} & \cdots & p_{0K} \\ \vdots & \ddots & \vdots \\ p_{K0} & \cdots & p_{KK} \end{bmatrix} \tag{4}$$

Along these lines, p_{kj} refers to the probability of finding a worker in state *j* at the end of the period given that the worker was at state *k* at the beginning of the period.[3] The P matrix can be estimated by the maximum likelihood estimator for $p_{kj} = \frac{N_{kj}}{N_{k.}}$ where N_{kj} is the number of transitions from state *k* to *j* and $N_{k.}$ is the number of transitions out of state *k*.

For the specific purposes of the study, we identify X_t to denote the labor market state of a given individual at time *t*. We define the state space *K* to comprise three labor market states; employed (E), unemployed (U) and inactive (N).

In the following analysis, we estimate the P-matrix of raw transition probabilities for 2006-2007, 2007-2008, 2008-2009 and 2009-2010 flows. That is, we construct four different P-matrices for one year transitions before and after 2008 which is the year when the Turkish government started to enact comprehensive labor market reforms. In this way, we compare transition tendencies across different time spans, associated with different labor market regulations. Comparing the transition probabilities into and out of employment, unemployment and inactivity before and after 2008 will help evaluate the effects of recent labor reforms on the labor market outcomes.

[2] For further information, see http://www.math.rutgers.edu/courses/338/coursenotes/chapter5.pdf
[3] As Lehmann and Pignatti (2007) state, these estimates are close to the true transition probabilities in the absence of round-tripping.

Markov analysis is tailored in a way to allow identifying the impact of recent labor market reforms on the labor market outcomes. The main driver of the recent reforms was to mitigate the detrimental repercussions of the 2008 global financial crisis on the Turkish economy. Given the comprehensive review of legal and institutional labor market reforms in the previous section, we calculate the transition tendencies of the specific groups of individuals for whom the measures are targeted. In other words, we identify the characteristics of the individuals who are eligible to benefit from the government incentives (youth and women) and check out if transition probabilities of these individuals over the 2006-2010 period reveal any information about the nature and extent of any effect. For example, we ask whether transition probability of moving from unemployment to employment states for a target group has indeed increased.

6. Empirical Results

As mentioned above, the impact of the global financial crisis on the Turkish labor market was felt heavily in 2008. The effects of the reform packages that were initiated in the second half of 2008 and continued in 2009 started to be observed in 2009. Therefore, the adverse effects of the crisis are reflected in the transition probabilities of 2008-9 while the beneficial effects of reform packages are reflected in both 2008-9 and 2009-10 transition probabilities.[4]

Table 4 presents transition probabilities for the whole sample. In each cell, the figure at the top represents the transition probability (%). By definition, p_{jj} reflects the probability that an individual remains in a given state. From 2006 to 2007, one observes that approximately 87.05 percent of those who are initially employed remain in their state. A similar result also seems to hold for 2007-8 and 2009-10 transitions. Whereas, for the 2008-9 transitions there is a small decrease in the probability (85.54 percent), which is a mere reflection of the effect of the economic crisis. Another indication of the crisis in the 2008-9 transitions is the increase in the transition probability of moving from employment state to unemployment state. As seen in the table, this probability is around 4.5 percent in the 2006-7 and 2007-8 transitions while it increases to 7.21 percent in the 2008-9 transitions. Given that both the probability of remaining in the employment state and the transition probability of moving from employment to unemployment turn back to their pre-crisis levels in the 2009-10 transitions (88.37 and 5.08 percents, respectively), we can conclude that the policy measures had indeed produced some intended results.

<Insert Table 4 here>

Another reflection of the impacts of the crisis and the reform packages can be seen upon examining those individuals who were unemployed in the previous period. For example, the probabilities of remaining in unemployment were 21.73 and 24.71 percents in the 2006-2007 and 2007-8 transitions, respectively while

[4] It might be argued that the labor market reform packages were the main stimulus to the recovery in the Turkish labor markets, although the recovery depends also on the stability-oriented macroeconomic policies.

it increased with the impact of the crisis to 32.61 percent in the 2008-9 transitions, and then it decreased to 28.15 percent in the 2009-10 transitions. This decrease depends primarily on the fact that unemployed workers moved to employment. The probability of moving from unemployment to employment decreased substantially to 35.81 percent with the effect of the crisis, and then it showed a strong increase to 41.17 percent, returning almost to its pre-crisis levels. The observed recovery in the 2009-10 transitions in both the probability of remaining in unemployment and of moving from unemployment to employment may be attributed to the beneficial effects of the labor market reform policies.

The behavior of inactive individuals during the crisis is also important. As can be seen from Table 4, compared to the pre-crisis period, the probability of moving from unemployment to inactive state is not higher in the crisis period; on the contrary, it is lower. On the other hand, an increase is observed in the transitions from inactive state to unemployment during the crisis. Thus, it might be inferred that the added worker effect was dominant during the crisis.

As mentioned above, one of the target groups of labor market reforms was women. In order to see the effects of the reforms by gender, we present in Tables 5 and 6 the transition probabilities calculated separately for males and females. It is observed from Table 5 that the patterns of transition probabilities obtained for males are similar to those calculated for the overall sample (Table 4). For female workers (Table 6), the transition probability of remaining in employment and the transition probabilities of moving from employment to unemployment, from employment to inactive, from unemployment to employment are quite similar in structure to those calculated for the overall sample as well as for males. The transition probability of female workers remaining in unemployment is also similar to those computed for the overall sample and for males in the 2006-7, 2007-8 and 2008-9 transitions. This probability is around 14 percent in the 2006-7 and 2007-8 transitions, and it shows a significant increase to 23.16 percent in the 2008-9 transitions as a result of the economic crisis. However, in the 2009-10 transitions, contrary to the overall sample and to males, the female workers' probability of remaining unemployed exhibits an increase (from 23.16 to 26.5 percent). Considering the reform package specifically targeting female employment, this may seem to be a puzzle. However, upon a careful examination of Table 6, it is seen that although there is an increase in the 2009-10 transition probability of female workers moving from unemployment to employment (from 26.5 to 28.08 percent) which could reflect the effects of the reform package targeting females, in contrast to males, there is a decrease in the probability of moving from unemployment to inactive state (from 50.34 to 45.43 percent). This shows us that compared to the previous periods, in the 2009-10 period, unemployed women, instead of exiting the labor force, preferred to remain in the labor force to a greater extent (i.e., they became less discouraged). Because it is not easy for unemployed women to get jobs, this fact is reflected in a puzzle-like increase in the 2009-10 transition probability of female workers remaining unemployed. Another important point about Tables 5 and 6 is that the added worker effect observed for the overall sample is also observed for females and especially

for males. The last result regarding females was confirmed by studies of Uysal (2013) and Balkan et al. (2014) who also reported an added worker effect for women during the crisis.

It is important to compare men and women to understand the effects of the reform packages. The first package that we will analyze is the one that was put effect in July 2008 and involved additional reductions in the social security premiums for the young (18-29 age group) and women workers. In order to see whether the package had its intended effects, we will first compare the 2008-9 transitions of men and women from unemployment to employment. This transition exhibited a significant decrease for male workers compared to the pre-crisis period (from 47.68 to 41.04 percent) while the decrease was relatively limited for females (from 27.61 to 26.5 percent).[5] This may be taken as an indication of the reform package targeting female workers having achieved its intended goals to some extent. The reform packages mentioned above were extended in February 2009 to include men above 29 years of age who hold a certificate of professional competence and in August 2009 to include all newly hired workers. Therefore, to be able to see the effects of these 2009 modifications, we can compare workers moving from unemployment to employment in the 2008-9 and 2009-10 transitions. It is observed from Tables 5 and 6 that the transition probability of male workers moving from unemployment to employment increased substantially in the post-crisis period of 2009-10 (from 41.04 to 47.33 percents) while the increase was limited for female workers (from 26.5 to 28.8 percents). This observation may be interpreted as an indication that after the coverage of the reform package was widened to include all workers, the advantage of female workers was eliminated, and starting from August 2009, employers generally preferred male workers over female workers in new recruits. A similar finding is reported by Uysal (2013).

<Insert Table 5 here>

<Insert Table 6 here>

In order to further analyze the effects of labor market reforms, we have also calculated transition probabilities by age groups. Tables 7, 8 and 9 present the transition probabilities for 15-29, 30-49 and 50-64 age groups, respectively. When we examine Table 7 to see the effects of reforms targeting young workers, we observe a decrease in the 2008-9 transitions from unemployment to employment due to the economic crisis (from 43.41 to 39.31 percents). In the same 2008-9 transitions, there is also a similar decrease for the age group 30-49 (Table 8) in the probability of moving from unemployment to employment (from 44.44% to 38.43%). Thus, it could be argued that the measures for young workers provided some positive results, though the effect was quite small. (This result is consistent with our comment given in Footnote 5.) As mentioned before, the reform package of July 2008 targeting young and female workers was extended in August 2009 to cover all newly hired workers. An examination of 2009-10 period reveals that the transition from unemployment to employment for young workers (Table

[5] Although the same reform package includes young males (18-29 age group), it is understood that the measures taken were not as effective as desired for males. This result is consistent with that obtained by Balkan et al. (2014) who analyze the effects of the labor market reforms for different groups by using the difference-in-differences method.

7) involves a decrease (from 39.31 to 38.98 percent) while for the age group 30-49 (Table 8) it exhibits a substantial increase (from 38.43 to 48.68 percent). As a result, it could be argued that after the coverage of the reform package targeting young workers was broadened to include all age groups, the advantage of young workers was lost, and employers generally preferred older and more experienced workers over younger and inexperienced workers.

<Insert Table 7 here>

<Insert Table 8 here>

<Insert Table 9 here>

Although the reform packages did not involve regulations targeting different education groups, it is important to examine the behavior of these groups during the crisis. Tables 10-13 display the transition probabilities by education groups. First thing to note in the tables is that the probability of remaining in employment increases with education. For the period under investigation this probability is around 70 percent for the "no school" group (Table 10), while it is around 85, 90 and 95 percents for the "secondary" (Table 11), "high school" (Table 12), and "university" (Table 13) groups, respectively. When the tables for the educated groups (the secondary, high school and university) are examined, it is observed that the transition probabilities of moving from employment to unemployment increase substantially in the 2008-9 transitions due to the economic crisis while they exhibit a strong decrease in the post-crisis period of 2009-10, turning back nearly to their pre-crisis levels. The decrease is more pronounced for the university group; that is to say, the university graduates faced a greater decrease in the probability of losing their jobs in the post-crisis period. On the other hand, it is also observed from the tables that there is a decrease in the probability of moving from unemployment to employment during the crisis period of 2008-9, the decrease being more pronounced again for the university group. In other words, the probability of finding a job during the crisis is lower for more educated individuals. In the post-crisis period of 2009-10, the probability of moving from unemployment to employment increases for all education groups. For the secondary and the high school groups it turns back to almost its pre-crisis levels (42.97 and 38.37 percents, respectively) while for the university graduates it can recover only to 5 percent below its pre-crisis level (40.18 percent).

<Insert Table 10 here>

<Insert Table 11 here>

<Insert Table 12 here>

<Insert Table 13 here>

For the no-school group, the picture is different. First of all, contrary to the other groups, the probability of uneducated individuals losing their jobs decreases with the crisis (the probability of moving from employment to unemployment falls from 10 to 7.17 percent) while it increases after the crisis (from 7.17 to 9.03 percent). A possible reason for this interesting result could be that employers might have increased the share of low-salaried uneducated workers in their labor force during the crisis to decrease their operating costs, and once the effect of the crisis had passed, they again might have preferred educated and more qualified workers. When we examine the transitions from unemployment to employment for the no-school group, we observe a greater decrease during the crisis (from 47.27 to 31.43 percent), and a weaker recovery in the post-crisis period (from 31.43 to 36.05 percent) compared to the other education groups. Finally, there is a significant discouraged worker effect for the no-school group during the crisis while for the other groups there seems to exist a moderate added worker effect.

6. Conclusion

The adverse effects of the 2008 global financial crisis were felt heavily in labor markets. In an attempt to mitigate the unfavorable impacts of the crisis, countries took various measures in their labor markets. The crisis had its ravaging effects on the Turkish economy beginning the last quarter of 2008. Industrial activity fell by 40 percent and open unemployment rate rose by 5 percentage points to 15.4 percent by the first quarter of 2009; and GDP contracted by 4.7 percent over 2009. Turkey, as many other countries, introduced a number of measures known as the "employment packages" spread over the last quarter of 2008 and the first half of 2009 in order to combat exacerbating unemployment and output losses. The measures have included a general reduction of social security contributions, targeted reductions for hiring youth and women, an increase in unemployment insurance payments, increased subsidies for the disabled and impaired, the establishment of the Wage Guarantee Fund, a more active use of the short-time working compensation program, the launch of a temporary public employment program through public infrastructure investment, and an increase and more effective use of active employment programs.

This study performs a mobility analysis to investigate the impact of the 2008 global economic crisis and the effectiveness of the measures taken in the aftermath by analyzing worker transitions across different labor market states. More specifically, based on the Income and Living Conditions Survey panel data for 2006-2010, we compute the transition probabilities of individuals moving across three different labor market states: employment, unemployment and inactive. By using Markov processes, we calculate year-to-year transition probabilities over successive periods separately for the overall sample and by gender, age and education groups.

The results for the overall sample reveal that the global economic crisis caused the probability of remaining in employment to decrease and the probability of moving from employment to unemployment to decrease in the Turkish labor markets. In the post-crisis period, however, both probabilities turned back to their pre-crisis levels implying that the policy measures had indeed produced the intended results.

The economic crisis also made it more likely for people to remain in unemployment and less likely to move from unemployment to employment. Both probabilities showed a recovery during the post-crisis period which may be attributed, once again, to the beneficial effects of the labor market reform policies. There was also an increase in the transitions from inactive state to unemployment during the economic crisis implying that the added worker effect was dominant during the crisis.

One of the target groups of labor market reforms was women. The transition probabilities calculated separately for men and women are generally similar to those obtained for the overall sample. One difference is that, contrary to the overall sample and to males, the female workers' probability of remaining unemployed displayed an increase in the 2009-10 transitions which seems like a puzzle at first glance. However, a careful examination of the results reveals that in the same period, compared to the previous periods, unemployed women, instead of exiting the labor force, preferred to remain in the labor force to a greater extent; i.e., they became less discouraged. Because it is not easy for unemployed women to find jobs, this fact is reflected as an increase in the transitions probability of female workers remaining in unemployment in the post-crisis period. Another important finding of the study is that, similar to the overall sample, an added worker effect was present for both males and females during the crisis, it being stronger for males.

The reform package targeting young and female workers was put into effect in July 2008. In February 2009, it was extended to include men above 29 years of age who hold a certificate of professional competence and in August 2009 to include all newly hired workers. The results of our study show that transitions from unemployment to employment decreased significantly for males in the 2008-9 period compared to the pre-crisis period while the decrease was relatively limited for females indicating that the reform package targeting female workers achieved its intended goals. A similar finding also holds for young workers. The measures targeting young workers achieved some limited positive results initially in the 2008-9 transitions, making them slightly more likely to find a job compared to the other age groups. However, the results also show that after the coverage of the reform package was broadened to include all workers, the advantage of young and female workers was eliminated; beginning from this date, employers generally preferred male workers over female workers and older workers with more experience over younger and inexperienced workers.

The transition probabilities calculated for different education groups reveal that the probability of remaining in employment increases significantly with education. For the educated groups, the probability of losing their jobs rose substantially due to the economic crisis. In the post-crisis period, however, it displayed a strong recovery, especially for the university graduates. The educated groups, again especially the university graduates, also witnessed a decrease in the probability of finding a job during the crisis. In the aftermath of the crisis, however, the likelihood of finding a job increased for all education groups. Contrary to the other education groups, the probability of uneducated individuals losing their jobs decreased and it increased after the crisis. A possible reason for this curious result could be that employers

might have increased the share of low-salaried uneducated workers in their labor force during the crisis to decrease their operating costs, and once the effect of the crisis had passed, they again might have preferred educated and more qualified workers. Finally, the results of the study reveal there was a significant discouraged worker effect for the uneducated group during the crisis while for the other groups there seemed to exist a moderate added worker effect.

There are a number of policy implications from this study. The global economic crisis hit the Turkish labor markets very hard in 2008 but the recovery was quite strong. The reform packages designed to stabilize labor markets played an important role in this recovery. However, the reforms were put into effect when the impact of the crisis was felt most heavily. If the reform packages had been launched earlier, the adverse effects of the crisis would have been much less severe. Therefore, it is important to implement labor market policies and measures in a proactive manner.

The results of this study confirm that the policies targeting youth and women are effective in promoting the employment of these disadvantaged groups. However, in order to make the positive impact of such policies more evident, the measures targeting these groups should be increased and diversified, and the positive discrimination policies concerning the employment of these groups should be implemented also in non-crisis periods. The results of our study further revealed that after the coverage of the measures targeting youth and women was broadened to include all workers, the advantage of young and female workers disappeared. Thus, policy makers should take into consideration the possible interactions among different labor market measures in designing their policies.

Competing Interests

The authors declare that they have no competing interests.

Authors' Information

E.O. Acar is an Assist. Professor of Economics at the Dept. of Banking&Finance of Cankaya University.
S.M. Cilasun is an Assoc. Professor of Economics at the Dept. of Economics of Atilim University.
B. Gunalp is a Professor of Economics at the Dept. of Economics of Hacettepe University.

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Tables

Table 1. Turkish Labor Market, Distribution of Sample Labor Market States (Age 15-64 only)

	2006		2007		2008		2009		2010	
	N	%	N	%	N	%	N	%	N	%
Unemployed(U)	1433	5.44	1268	4.8	1477	5.4	1917	6.8	1170	5.84
Inactive (N)	12567	47.7	12342	46.6	12533	45.8	12886	45.1	8782	44.34
Employed (E)	12349	46.9	12865	48.59	13371	48.8	13776	48.2	9856	49.82
Total	26349	100	26475	100	27381	100	28579	100	19808	100

Source: Authors' own calculations based on SILC 2006-2010.

Table 2. Turkish Labor Market, distribution of sample labor market states (Age 15-64 and Men)

	2006		2007		2008		2009		2010	
	N	%	N	%	N	%	N	%	N	%
Unemployed(U)	1093	8.9	991	8	1080	8.4	1358	9.9	835	9.28
Inactive (N)	2789	22.8	2728	22	2689	20.8	2890	21.2	1856	20.62
Employed (E)	8351	68.2	8674	69.9	9160	70.9	9389	69	6312	70.1
Total	12233	100	12393	100	12929	100	13637	100	9003	100

Source: Authors' own calculations based on SILC 2006-2010.

Table 3. Turkish Labor Market, distribution of sample labor market states (Age 15-64 and Women)

	2006		2007		2008		2009		2010	
	N	%	N	%	N	%	N	%	N	%
Unemployed(U)	340	2.4	277	1.9	397	2.8	559	6.8	278	2.58
Inactive (N)	9778	69.3	9614	68.3	9844	68.1	9996	45.1	7514	69.54
Employed (E)	3998	28.2	4191	29.8	4211	29.1	4387	48.2	3013	27.88
Total	14116	100	14082	100	14452	100	14942	100	10805	100

Source: Authors' own calculations based on SILC 2006-2010.

Table 4. Transition Probabilities for the Overall Sample, 2006-2010

	LMS 2007		
LMS 2006	**E**	**U**	**N**
E	87.05	4.41	8.53
U	46.19	21.73	32.09
N	6.17	2.39	91.43
P_{ij}	35.23	4.08	60.7

	LMS 2009		
LMS 2008	**E**	**U**	**N**
E	85.54	7.21	7.03
U	35.81	32.61	32.76
N	4.63	3.57	91.92
P_{ij}	35.96	6.28	59.29

	LMS 2008		
LMS 2007	**E**	**U**	**N**
E	88.41	4.56	8.53
U	42.53	24.71	32.09
N	5.35	2.74	91.43
P_{ij}	36.48	4.24	60.7

	LMS 2010		
LMS 2009	**E**	**U**	**N**
E	88.37	5.08	7.25
U	41.17	28.15	31.59
N	4.14	2.13	91.8
P_{ij}	33.09	4.57	57.76

Table 5. Transition Probabilities for Males, 2006-2010

	LMS 2007		
LMS 2006	**E**	**U**	**N**
E	90.03	4.61	5.36
U	52.82	24.47	22.72
N	13.26	5.97	80.77
P_{ij}	62.84	6.79	30.77

	LMS 2009		
LMS 2008	**E**	**U**	**N**
E	88.07	7.44	4.49
U	41.04	36.93	22.03
N	10.86	7.99	81.15
P_{ij}	62.85	9.72	27.42

	LMS 2008		
LMS 2007	**E**	**U**	**N**
E	90.2	5.02	4.78
U	47.68	28.35	23.97
N	11.9	5.7	82.4
P_{ij}	63.89	6.76	29.35

	LMS 2010		
LMS 2009	**E**	**U**	**N**
E	90.31	5.25	4.44
U	47.33	28.93	23.74
N	7	4.5	88.5
P_{ij}	56.08	7.06	36.86

Table 6. Transition Probabilities for Females, 2006-2010

	LMS 2007		
LMS 2006	**E**	**U**	**N**
E	76.13	3.68	20.19
U	27.22	13.89	58.89
N	4.16	1.38	94.46
P_{ij}	13.83	1.97	84.2

	LMS 2009		
LMS 2008	**E**	**U**	**N**
E	77.02	6.44	16.54
U	26.5	23.16	50.34
N	2.94	2.37	94.7
P_{ij}	14.73	3.57	81.71

	LMS 2008		
LMS 2007	**E**	**U**	**N**
E	82.26	2.96	14.79
U	27.61	14.18	58.21
N	3.53	1.91	94.56
P_{ij}	15.17	2.28	82.55

	LMS 2010		
LMS 2009	**E**	**U**	**N**
E	82.06	4.52	13.42
U	28.08	26.5	45.43
N	3.13	1.29	95.58
P_{ij}	14.59	2.56	82.85

Table 7. Transition Probabilities for the Age Group 15-29, 2006-2010

	LMS 2007		
LMS 2006	**E**	**U**	**N**
E	84.78	5.57	9.66
U	47.23	21.11	31.66
N	9.38	3.71	86.91
P_{ij}	34.6	5.57	59.83

	LMS 2009		
LMS 2008	**E**	**U**	**N**
E	83.05	8.58	8.36
U	39.31	30.06	30.64
N	7.08	5.56	87.36
P_{ij}	34.67	8.12	57.21

	LMS 2008		
LMS 2007	**E**	**U**	**N**
E	84.85	6.07	9.08
U	43.41	24.03	32.56
N	8.5	4.5	87
P_{ij}	34.43	6.02	59.55

	LMS 2010		
LMS 2009	**E**	**U**	**N**
E	83.96	7.21	8.83
U	38.98	29.78	31,23
N	7.67	4.15	88.18
P_{ij}	32.53	7.29	60.18

Table 8. Transition Probabilities for the Age Group 30-49, 2006-2010

	LMS 2007		
LMS 2006	**E**	**U**	**N**
E	90.5	3.73	5.77
U	49.36		28.09
N	5.24	1.56	93.2
P_{ij}	45.23	3.46	51.31

	LMS 2009		
LMS 2008	**E**	**U**	**N**
E	88.22	6.7	5.08
U	38.43	32.94	28.63
N	3.79	2.93	93.28
P_{ij}	45.5	6.04	48.46

	LMS 2008		
LMS 2007	**E**	**U**	**N**
E	91.87	3.81	4.31
U	44.44	27.51	28.04
N	4.34	2.34	93.32
P_{ij}	46.85	3.89	49.26

	LMS 2010		
LMS 2009	**E**	**U**	**N**
E	91.73	4.37	3.9
U	48.68	26.46	24.87
N	4.5	2.14	93.36
P_{ij}	50.22	4.77	45.01

Table 9. Transition Probabilities for the Age Group 50-64, 2006-2010

	LMS 2007		
LMS 2006	**E**	**U**	**N**
E	73.46	4.29	22.25
U	24.07	16.67	59.26
N	2.81	1.36	95.83
P_{ij}	14.19	2.15	83.66

	LMS 2009		
LMS 2008	**E**	**U**	**N**
E	77.53	5.39	17.08
U	8.77	38.6	52.63
N	1.87	1.2	96.93
P_{ij}	15.05	2.75	82.2

	LMS 2008		
LMS 2007	**E**	**U**	**N**
E	78.12	4.24	17.65
U	25.45	18.18	56.36
N	1.77	0.54	97.69
P_{ij}	15.19	1.55	83.26

	LMS 2010		
LMS 2009	**E**	**U**	**N**
E	79.49	4.54	15.98
U	15.84	28.71	55.45
N	2.32	1.45	96.23
P_{ij}	17.46	3.07	79.48

Table 10. Transition Probabilities for the "No-School" Group, 2006-2010

	LMS 2007		
LMS 2006	**E**	**U**	**N**
E	66.12	9.5	24.38
U	37.84	16.22	45.95
N	3.13	0.91	95.96
P_{ij}	10.9	2.31	86.79

	LMS 2009		
LMS 2008	**E**	**U**	**N**
E	71.34	7.17	21.5
U	31.43	30	38.57
N	2.38	0.54	97.08
P_{ij}	12.06	2.25	85.69

	LMS 2008		
LMS 2007	**E**	**U**	**N**
E	71.15	10	18.85
U	47.27	21.82	30.91
N	2.54	1.02	96.44
P_{ij}	11.43	2.54	86.03

	LMS 2010		
LMS 2009	**E**	**U**	**N**
E	74.31	9.03	16.67
U	36.05	32.56	31.4
N	1.4	0.42	98.19
P_{ij}	7.81	1.82	90.37

Table 11. Transition Probabilities for the "Secondary" Group, 2006-2010

	LMS 2007		
LMS 2006	**E**	**U**	**N**
E	85.89	4.82	9.29
U	50.55	24.03	25.41
N	5.29	1.97	92.73
P_{ij}	34.74	4.06	61.2

	LMS 2009		
LMS 2008	**E**	**U**	**N**
E	83.47	9.15	7.38
U	36.9	33.69	29.41
N	4.22	3.15	92.64
P_{ij}	33.13	6.7	60.17

	LMS 2008		
LMS 2007	**E**	**U**	**N**
E	87.23	5.36	7.41
U	43.53	27.34	29.14
N	5.17	2.4	92.43
P_{ij}	35.34	4.41	60.25

	LMS 2010		
LMS 2009	**E**	**U**	**N**
E	86.19	6.75	7.06
U	42.97	26.97	30.06
N	4.52	2.13	93.35
P_{ij}	31.74	5.05	63.2

Table 12. Transition Probabilities for the "High School" Group, 2006-2010

	LMS 2007		
LMS 2006	**E**	**U**	**N**
E	90.08	4.22	5.7
U	42.2	16.76	41.04
N	10.36	5.1	84.53
P_{ij}	46.08	5.56	48.35

	LMS 2009		
LMS 2008	**E**	**U**	**N**
E	87.29	6.5	6.2
U	35.8	29.63	34.57
N	6.85	7.53	85.62
P_{ij}	46.77	8.32	44.92

	LMS 2008		
LMS 2007	**E**	**U**	**N**
E	90.83	3.72	5.45
U	38.69	21.9	39.42
N	7.1	4.66	88.24
P_{ij}	46.6	5.16	48.24

	LMS 2010		
LMS 2009	**E**	**U**	**N**
E	90.06	4.32	5.62
U	38.37	28.68	32.95
N	6.5	3.84	89.65
P_{ij}	47.92	6.2	45.88

Table 13. Transition Probabilities for the "University" Group, 2006-2010

	LMS 2007		
LMS 2006	**E**	**U**	**N**
E	95.21	0.99	3.8
U	45.45	30.91	23.64
N	12.5	4.46	83.04
P_{ij}	73.71	3.44	22.85

	LMS 2009		
LMS 2008	**E**	**U**	**N**
E	93.5	3.1	3.4
U	34.33	35.82	29.85
N	12.19	6.81	81
P_{ij}	73.7	5.5	20.8

	LMS 2008		
LMS 2007	**E**	**U**	**N**
E	94.35	1.65	4
U	45	22.5	32.5
N	12.66	5.06	82.28
P_{ij}	75.42	3.11	21.47

	LMS 2010		
LMS 2009	**E**	**U**	**N**
E	95.29	1.31	3.4
U	40.18	31.25	28.57
N	9.94	7.39	82.67
P_{ij}	72.8	4.72	22.48